

## Understanding Time Pressure in Pursuing Reliable Healthcare Organizations, Ethnography in Operating Rooms of a Dutch Academic Hospital

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### Abstract

*Usually, time pressure is pictured as an unavoidable constraint in the background in the strive for reliably organising safe care. This study reverses foreground and background and aims to understand the phenomenon of time pressure against the background of the strive for reliably organising safe care.*

*We gathered ethnographic data in a Dutch academic hospital during 103 hours of participative observation in non-acute operating teams of one surgical specialty. We analysed the data in an iterative process, using the method of thinking with theory. The results are presented in narrative vignettes and quotes clustered around three attitudes and three behaviours that create or resolve time pressure: 1 avoiding conflict, 2 deference to speed, 3 preoccupations with productivity, 4 skipping new routines, 5 adhering to old routines and regulations 6 creating team situation awareness.*

*Time pressure was co-created by frontline professionals in a context where preoccupation with productivity was pervasive, speed was valued as a sign of professional excellence, and maintaining good relations while pursuing different priorities was a daily challenge. Coping with time pressure was influenced by regulations, habits, and the capability of creating situational awareness in the teams.*

*Understanding the phenomenon of time pressure from the combined perspective of habit theory and reliable organising theory learns that: 1 at team level time pressure can be a constraint as well as a stimulus for reliable organising, 2 alertness and habitual action are often interlinked, 3 heedful relating can stimulate constructive conflict and avoid it as well.*

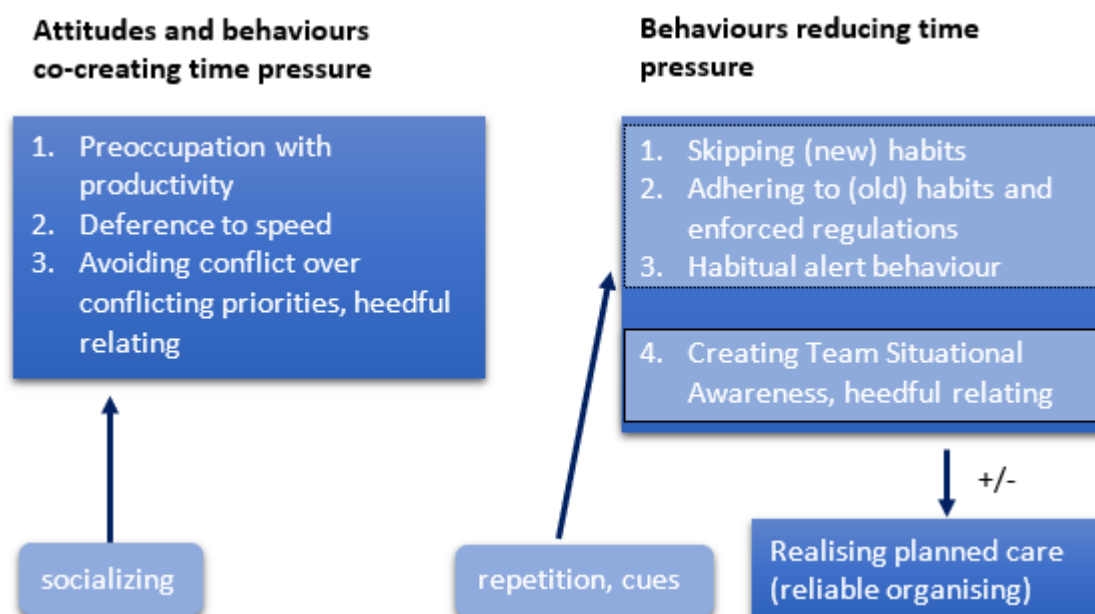
*We conclude that our analysis generates directions for interventions that might favour reduction of time pressure and reliable organising of safe care at the same time. The chosen methodology was helpful in grasping the complexity of the phenomenon of time pressure in its context.*

**Keywords:** time pressure, habits, routines, high reliability organising, patient safety, interprofessional teams, preoccupation with productivity, workload, ethnography.

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**Figure 1. Graphical abstract:** The elements creating time pressure are pictured on the left, the strategies to reduce it on the right. The strategy of creating team situational awareness fostered the pursuit of reliable organising. The other coping strategies fostered reliability as well as endangered it. Habits are shaped by repetition and cues. Attitudes are shaped in socializing processes.

## Introduction

Since the report “to err is human” [1], healthcare organisations worldwide developed many initiatives, programs, tools for change, and change philosophies in order to reduce the number of preventable harms to patients. It is widely recognized that consistent safe practice in healthcare is rarely attained notwithstanding all the initiatives and programs. Therefore, we stepped back from interventions and programs and chose to observe a healthcare team to gain a deeper understanding of the lived experience of healthcare professionals trying to improve the safety of their practice. Right from the start in our explorative ethnographic approach, time pressure came up as a dominant theme and a major argument for not attaining improvement goals or attending meetings. Therefore, we chose to select time pressure as our main subject.

In many studies time pressure is considered as a given constraint in the complex and dynamic background against which one has to perform reliably in order to prevent adverse events, or even disasters, and against which one has to allot time to improvement initiatives. Within this study we reverse foreground and background by studying time pressure in teams against the background of an initiative directed at improving reliable performance of safe care in the operating rooms.

The philosophical studies on time pressure [2-4]. describe how societal changes, religions and beliefs are related to awareness of limited time and valuing productivity. Studies

on coping behaviours and decision making under time pressure are usually situated in the psychological domain [5-7]. These studies typically seek for correlations between individual psychological characteristics and the susceptibility to stress, fatigue and burn-out. It is in essence about individual competences and resilience in the face of a large workload. In acute care, studies on coping with time pressure are performed in relation to quality of decision making [8].

To our knowledge there is no research that studies time pressure at the team level in non-acute settings. Nor do we know of any research that studies time pressure in the context of improving healthcare. We define time pressure as a sense of urgency caused by having too many demands on one’s time or resources (Oxford Dictionary). Patient safety is usually defined as the absence of preventable harm and as such refers to the outcome of a healthcare process. Throughout this paper we use this term to reflect the perspective and language of the healthcare professionals. This definition comes close to the oath of Hippocrates that physicians take: “first do no harm”. In daily use they often refer not only to the outcome for the patient but also to the process of caregiving and treatment that leads to this outcome. We as researchers use the term reliable organising to refer to that process, and more specific to the behaviours that teams deploy to perceive and interpret risks and weak signals, and to act on unexpected events. In this study we aim to understand the phenomenon of time pressure in operating teams against the background of their effort to improve patient safety by implementing a briefing at the start of the day and by stimulating speak up.

## Methods

### Setting

The case entails a multidisciplinary OR team in an academic hospital, involving all surgeons, OR nurses and residents of one specialty plus the anaesthetists and anaesthesia assistants (nurses) who regularly participate in this team but are not dedicated to this surgical specialty alone. Acute care in this specialty is rare. The OR nurses work mainly in this specialty but regularly in other teams as well. We selected this specific team because they decided to implement crew resource management (CRM) in order to improve patient safety. Most other specialties in the OR had already started with CRM and with briefings at the start of the day. The hospital policy is to promote CRM, knowing that normal accidents, or system accidents, represent a breakdown in social processes and comprehension rather than technology [9]. Therefore, the board stimulated departments to participate in the CRM program.

The team (ca 45 members) enrolled in a CRM training program of 1 day in three groups of ca 15 participants. The training offered some theory on human error and normal accidents and aimed to raise awareness about their own human fallibility, their risky team behaviours and to raise ideas about how to improve the reliability of their operating process. A representation of the team formed the core team, which was assigned to implement new working methods and routines in line with the idea of CRM to reduce errors and harm and thus to improve patient safety. The team chose to implement a briefing at the start of the day and to stimulate “speak-up”, which means to express one’s opinion frankly and openly. Part of the team felt that participating in a CRM training was an obligation that was top-down forced upon them.

A nationwide benchmark has revealed that the OR in this Dutch academic hospital is a well-organised unit, excelling in occupancy rate and few schedule overruns at the end of the day. In the Joint Commission International (JCI) accreditation in 2018 the OR was mentioned as a worldwide best practice, mainly due to the way they organise their surgical checkpoints. One of these checkpoints is the time out before incision during which one checks, among other things, whether all resources during and after the operation are available to tackle complications like bleeding, cardiac arrest, or conversion from a laparoscopic operation to an open procedure. Every specialty has a multidisciplinary workplace management team that coordinates the weekly OR planning.

### Reflexivity

The participant researcher (AvH) is a change consultant by profession. She was asked by the Board to organise the CRM programme in the hospital, and she was asked by the department of this specialty to support the implementation of CRM in this specific team. As such the ethnographic participative researcher had multiple roles: as a trainer she delivered the CRM training and the core team training, as a facilitator she coached the core team during their first

implementation period and as a researcher she observed all interactions and actions during meetings and in the operating room.

Participating in the group shaped a natural pretext to attend the meetings and operations as a relative insider. It enabled many informal conversations in which participants were more inclined to disclose their thoughts and feelings than in formal meetings. Because of her prolonged engagement in many operating teams she was sensitive to standard practice and deviations from that standard. To ensure open minded observations the researcher made fieldnotes that were discussed within the research team. In these fieldnotes she also reflected on her own thoughts, assumptions and feelings.

### Design and data collection, analysis and trustworthiness

The data were gathered in a ten months period. In this period, data were gathered during: 8 hours of stakeholder interviews, 24 hours of CRM training, 42 hours of OR observation, 8 hours of informal conversation, 15 hours of core team meetings and 6 hours of attendance in patient handover and morbidity and mortality meetings. In addition, there were e-mails, telephone calls and mixed meetings with other teams. Nearly all interviews and meetings of the core team were recorded and transcribed. Other relevant meetings were logged in field notes.

We followed a naturalistic case study design [10] with a participant observer. This means that we studied the setting in-depth to understand a single demarcated entity without the intention to change it for reasons of research. During the first phase of the data collection, the observer reflected frequently with another researcher in order to stay as open-minded as possible. Personal predispositions to certain interpretations were made explicit, discussed, and sometimes adjusted. The theme of time and time pressure emerged from the data and was not a predefined subject of the study. The original question to guide the observations was as broad as: how does this team develop and implement the chosen improvements for patients and professionals?

Besides the bilateral reflections every two weeks, all co-authors read the fieldnotes in three tranches during the study period. We deepened our analysis by the method ‘thinking with theory’ proposed by Jackson and Mazzei (2013). In this method, the data gathered are interpreted from theoretical perspectives to discover unanticipated details and new interpretations or meanings. In this way, understanding the data and searching for new perspectives in theories, go together in an iterative process and offer opportunity for unexpected, multi-layered, nuanced, and holistic insights. In the first two diverging tranches, a range of theories and concepts were used to interpret the data. The theoretical notions with which the data were interpreted were philosophical, medical, educational, psychological, social, organisational, economic. In the converging phase, after the third tranche of observations, the authors converged to three supporting fields of

knowledge: crew resource management, theory of highly reliable organising and theory of habits.

To enhance the trustworthiness of the research [11,12], the following procedures were used.

First, credibility was ensured by:

- **Prolonged engagement:** The prime researcher (AvH) spent 18 months in the research setting and was familiar with the larger context of the OR as a consequence of other projects being carried out. Co-researcher (HG) worked as a surgeon in other hospitals for many years and as the head of the Operating Room department of this Hospital at the time. This so-called prolonged engagement enabled the researchers to perform persistent and reliable observations.
- **Data triangulation:** We present a thick description taken from one meeting. But our observations and interpretations were sustained by data from other settings, other participants and other moments.
- **Investigator triangulation:** Four researchers, from different backgrounds, were involved in reading and analysing the data.
- **Member checking:** The credibility of the findings was examined from an insider perspective by asking the co-authors and the members of the core team to give their comments on the story and the interpretation presented.
- **Method triangulation:** We used several methods to gather data, such as interviews and informal conversations, observations, and documents.
- **Theory triangulation:** We used more than one theoretical scheme in the interpretation of the phenomenon.

Second, we ensured transferability by rendering thick descriptions [13] evoking “vicarious experiences” [10]. Third, for reasons of dependability and confirmability we described our research design and data collection process in quite some detail. All co-authors read the interview transcripts and field notes and were involved in the discussion.

Fourth, reflexivity was sought in all phases of the study by discussing our conceptual lenses and assumptions, stimulated by the different backgrounds of the authors (medical humanities, educational sciences, surgery, consultancy and business administration) and by discussing the role of the participant observer and the way she influenced the course of events and the reactions of the participants.

The names of the participants in the narrative are fictitious to ensure anonymity. The participants were asked for permission for the research, the members of the core team gave permission to be quoted and we obtained consent on the interpretation of the data from them.

## Theory

To understand, name or label the observed behaviours, we chose concepts derived from three bodies of knowledge: Crew Resource Management (CRM), Highly Reliable Organising theory (HRO), and Habit theory. Some background on each of these approaches or theories is given.

CRM is not a theory, but an operational management approach based on several, mainly psychological, theories. A central concept in CRM is situational awareness. This is defined [14] as “the perception of elements in the environment, the comprehension of their meaning in terms of task goals, and the projection of their status in the near future”. We choose the concept of team situational awareness because this reflects the language of the teams observed, after they received their CRM training. In the training they were told that the situation that the team must be aware of, comprises the situation of the patient, the environment, and the team members themselves. A related concept in highly reliable organising theory is “shared mental representation” [15].

Another important CRM concept is “speak up”. CRM stresses that team members must speak up if for example information is missing, if someone becomes trapped by his or her human fallibility or if a part of the team falls into group think.

CRM promotes to start a daily changing team with a short briefing, as a practical working method to support team situation awareness and speak up.

A High Reliability Organisation (HRO) [16] is an organisation that has succeeded in avoiding catastrophes in an environment where normal accidents can be expected due to risk factors and complexity. HRO is often seen as an ideal to strive for rather than a measurable endpoint. High reliability organising theory [17] focuses more on the process of organising than on the characteristics of the entity and it focuses more on the operational level than the organisational level. The body of knowledge on high reliability is vast and well developed over time. To understand the behaviours of the observed team with regard to time pressure we apply three central concepts from this field of knowledge: preoccupation with failure, collective mind and heedful interrelating.

Preoccupation with failure is an attribute of a high reliability organisation. It means that in the organisation one is continuously alert to detect possible risks, errors, or unexpected events on the operational level as well as on the organisational level. In our study we contrast this attribute to preoccupation with productivity.

Collective mind is defined as “a pattern of behaviours, that is more capable of mindful action when the interrelating is more heedful” [15,18]. Crucial is the notion that collective mind is defined as a pattern of *behaviours*. Mindfulness bears the connotations of heedfulness, alertness, and awareness; it requires attention, often conscious attention

but not necessarily. Mindful action can result from “subconscious” perceptions, like “smelling danger” while not yet knowing whether something is wrong. *Collective* mind refers to a *shared pattern* of behaviours. One might say a culture in which some behaviours are “done” or “not done” and in which one is often not even aware of these routines or habits until one moves into another setting.

Heedful interrelating is in our view elegantly described by Lingard et. al. [19] who describes the communications in the operation room (OR) as: “a complicated “dance” that maintains relationships and minimizes tension while still achieving goals”. Heedful interrelating requires sometimes speaking up and sometimes shutting up, sometimes avoiding conflict and sometimes addressing conflict. There are no rules or guidelines for heedful interrelating, except the norm that one must be aware of the value of good relations. Good relations create the willingness to help each other and the psychological safety [20] necessary to share information, even if the information is unpleasant.

Habit theory is relevant in our study because it opens a perspective on behavioural change and the role time pressure can take on in that process. CRM and HRO describe desirable behaviours and both perspectives stress the importance of the central goal of behaviours which should be safety or reliability. Habit theory on the other hand, perceives behaviours as mainly driven by habits, patterns, routines. A specific habit is performed when it is triggered by a signal or event in the context or in one’s mind. That

signal, or cue, can be sensory but can also be a location or time of the day for example. Changing a habit is most easily done when forced by a new context without triggers. To stop smoking is a lot easier if there are no cigarettes available. Even though most people think they are driven by goals, “Habit activation and performance are not readily influenced by people’s goals” [21]. Only moderately strong habits are more prone to the influence of goals. Then one requires a strong goal and a lot of conscious attention, until the new habit has been formed.

These concepts will guide our understanding of the experience of time pressure and the subsequent coping behaviours of the observed team against the background of their effort to improve patient safety by implementing a briefing at the start of the day and by stimulating speak up.

## Results

We structured the results around three attitudes and three behaviours presented in vignettes and quotes. The results grouped around the attitudes show how time pressure manifested itself and what participants revealed about how they experienced and perceived time pressure. The results on the three behaviours describe how participants coped with time pressure, and how these behaviours related to their improvement ambitions.

### Pursuing conflicting priorities and avoiding conflict

#### Vignette 1. speaking up and rearranging the schedule.

Jennifer (operating room-nurse):

The other day, it was really one of those days, you know. At the start of the day, it was already Murphy’s law. So, at eleven o’clock my colleague said: “We really won’t be going to make it before 4 p.m.” So, I said: “You’re right, we won’t make it if we’re going to do everything he (the surgeon) says. But we’re not going to bring this up any sooner than when we’ve finished this, because otherwise we’ll only get grumbling and discord.” She said: “All right, are you going to say it?” “Yes, I will.” So, at a suitable moment, when the patient had to be repositioned on the table, I said: “One thing, now or later, but I want us to look realistically at the programme for today and decide what’s going to be done and what not. Then we can all agree on that, and we won’t mention it again the rest of the day. If we must work overtime, we’ll settle now who will be the one because I get really annoyed if people ask every two hours ‘How much longer will it take?’.”

Then the surgeon said: “I’ll try to reschedule the program with the other rooms.” So, he went off. When he came back, he said: “It’s been arranged.” I said: “Alright, when this patient is off the table, I want to hear how we’re going to do it and how we’ll divide the tasks the rest of the day.” So, we did at the sign-out, when the patient was still asleep, and everybody agreed. So, in my room there wasn’t any grumbling anymore because I knew what to do and so did my colleagues.

I: This would be a really good example to share with your colleagues! Do you ever do so?

Jennifer: No, that’s of no use; it’s in your character and in your age. When I would be 20 years younger, I wouldn’t have done it either. Now I have the position and the guts to do this.

The moments team members experienced time pressure and the reasons why, differed per profession. This fragment shows the worries of the operating room-nurses about ending in time (4 pm) and that they perceived it as a “tricky subject” to bring it up, you really had to have “the guts to do so”. Not ending the working day in time worried or preoccupied them more than postponing a patient’s operation. The fragment also shows that the nurses, knowing that the surgeon’s preoccupation is operating all patients on the schedule, feared conflict if they discussed their concern. This added to the felt pressure. In this

example it could be resolved because one nurse had “*the position and the guts to do this*”.

In the CRM training the surgeons had labelled the discussion about the deadline for the last patient to be put on the operating table, as the most annoying discussion there is, especially if this discussion already starts at the beginning of the day. The trickiness of the subject is also illustrated by a quote of Jeroen (surgeon) in the core team meeting: “It really happened that I was operating and in the middle of a difficult phase when the floor manager peeped

her head around the corner to ask about the deadline for the last patient to be put on the table. Then I get really distracted and annoyed, speaking of safety!"

Interestingly, data from the hospital database showed that ending time was nearly always a little before or after 4 pm,

and that it seldom happened that a patient was cancelled for reasons of time. However, these data, which were shared every month with the teams, did not generate confidence in the attainability of the schedule of a specific day, nor did it take away their obvious preoccupations.

### **Vignette 2.** Anaesthetists experiencing time pressure at the start of the day.

Researcher Annet is seated at a table in the restaurant of the operating room complex and is chatting with two anaesthetists. At some point anaesthetist M. brings up the subject of time.

Anaesthetist M: We really start too late. In many operating rooms incision starts at 8.45 AM and then they always look at us, as if it is our fault. The delay caused by the briefing is always seen as part of the induction time and then they complain that we are slow. If the surgeons appear too late or draw out, and that can easily be an hour, then it is part of the job. But they do complain if we need five minutes more.

Anaesthetist S: Yeah, I always feel rushed, especially at the start of the day. We can start only in one room at the same time, and yet the second room is always annoyed when we show up 8.05 AM. And very often the surgeon in operating room one shows up too late and then we appear at 8.10 pm in room two.

The surgeons and anaesthetists agreed that, in case the anaesthetist had to supervise two operating rooms, one of the teams had to wait five minutes. Nevertheless, the anaesthetists wanted to avoid the irritation of surgeons having to wait, and at the same time they wanted to adhere to such a valued safety routine as the team start briefing.

In general, the core team agreed that "performing the briefing contributes to the feeling of being a team" as Sophia stated when evaluating the effects of the briefing. And this was valued highly.

Thus, surgeons, operating nurses, and anaesthetists experienced time pressure but for different norms and preoccupations. Pursuing conflicting priorities and avoiding conflict at the same time produced time pressure.

### **Deference to speed**

We observed several times that the surgeons, even if there was a short schedule that day, show their impatience during the induction, especially if induction takes longer than they expected. Then they stayed in the room, discussing the operation already, pacing the room, asking "How long will it take?" making remarks about the planning and about what they could have done in the meantime, etc. This impatience comes close to the experience of time pressure. Many anaesthetists experienced time pressure at such moments, as becomes evident in the quote of the anaesthetists. Relevant to know is that the saying in the OR went that "a good surgeon is a quick surgeon". Therefore, even if the workload was low, the surgeon was usually motivated to be fast. If the induction took long, it would affect the average operating time of that surgeon, because the operating time was defined as: the period from starting induction to closing the wound. The value of being fast counted for anaesthetists as well, as one of the leading anaesthetists explained in a chat.

### **Vignette 3.** Being fast as a source of respect.

At the end of working day researcher Annet is sitting down on the couch in the restaurant of the operating room complex with a cup of coffee, when anaesthetist B., familiar to her, comes in. He takes place next to her for a chat and at some point, they bring up the farewell of a mutually known colleague of him.

Researcher: "Did he decline a big farewell feast because he felt he had received too little recognition from his colleagues?"

Anaesthetist B: "Indeed. He meant a lot for the department and the hospital, especially in the field of quality and safety. A lot of people comment on that because he is not a fast hero on the floor in the OR and he is wordy. So what? He realised a lot of valuable initiatives that we would not have accomplished without him. [...] How important is it that you are fast?"

Researcher: "Is being handy and fast necessary to gain respect from your colleagues?"

Anaesthetist B: "uh..yes... yes, I'm afraid that that's true, but not with me! But I think that for most colleagues that is still true. It will change over time though, but only slowly."

Although being fast was important for anaesthetists as well, we observed on many occasions that anaesthetists more often prioritized safety routines over speed. For example, when it came to performing the briefing. This was recognized by members of the core team as can be

read in vignette 4. The deference to speed, serving as a hallmark of surgical excellence, contributed often to time pressure, even when the workload was low. Having to wait can induce pressure in the one who has to wait as well as in the one who has to be waited for.

## Preoccupation with productivity

### Vignette 4. Starting on time.

The core team is having a meeting to discuss the progress of the implementation of the briefing. Their main concern is how much time the briefing consumes several weeks after the start of the implementation.

Jennifer (OR-nurse): Things are improving, but it takes quite some time before everybody is present for the briefing. If we perform the briefing, and then the time-out, then we're seeing the first activity in the theatre at 8.20 a.m.! [again, with emphasis] 8.20 a.m.! That's really too late in my opinion.

Jeroen (surgeon): We've got the charts with late starts and early endings. You can see that start-up time has slowly been moving back to normal since the introduction of the briefing.

Jorin (resident): I often have the impression that the anaesthesia consultant is eager to attend the briefing. While with us, a surgeon consultant often or sometimes doesn't attend the briefing. George doesn't show up before the knife is in the patient and then the resident is allowed to start.

Jeroen: I'd start at 8.00 a.m. with the team available at that time, with as many people present as possible. So, then you have to have sort of minimal requirements. Staff members must be there as much as possible, or you're going to be wasting time needlessly. We'll be unable to motivate a few of our staff members. It's been the habit of many years for some not to show up in the theatre before the resident has made the incision.

George mentioned here, had the reputation of being a good and quick surgeon. He was responsible for the education of the residents and was placed high in the informal hierarchy. His preoccupation with productivity can be understood from the fragment above, but also from his arguments for skipping the briefing as presented in vignette 4. We recognize the managerial language when Jennifer and Jeroen speak about the occupancy of the operating rooms, but also the tendency to make a trade-off between the demands of their fellow surgeons, who viewed the briefing as a waste of time, and the nurses who viewed the briefing as a way to win time, because it helped them in anticipating on needed materials later on that day. The anaesthetists, as we know from other conversations, viewed the briefing as a way to improve team situational awareness and safety more than as a way to win or lose time. Nevertheless, when the team discussed the fact that the anaesthetists sometimes became weary and started yawning during the operation and often started seeking for distraction, they denied that they were bored or passive. Also, the head of their department did not want to discuss that observation. To the researcher it seemed to be a taboo, which can be understood in a context where productivity was valued so highly. The focus on productivity is also shown in the next quotes.

Sophie: The item "fit to fly" in the briefing is always being rushed through. Jeroen (indignantly and with loud voice): I know. I've been standing there, really not fit to fly because I'd caught a serious cold. But, I mean, am I supposed to say then that I'm not fit to fly? And let them take away a whole day's programme?

At member checking this fragment, Jeroen could hardly believe that he had said that because his motivation, so he explained, is that it would be dreadful for the patients if operations should be cancelled or handed over to someone else. Yet this worry resulted in a narrower kind of preoccupation in terms of productivity reflected by language such as "a whole day's programme" that "they" would take away.

The manager of the surgeons stated the following about the productivity drive: We have a large supply of patients so it is more that we receive a lot than that we push to produce a lot. Really, we produce too much, so rather not. We have a certain expertise, a large front door and the conviction and ambition that we are the best for those patients. So, we are not going to refer them to someone else, and then the solution is "to keep one's shoulder to the wheel".

The Department head of the surgeons of this specialty stated: We strongly feel that for a good surgeon clinical work comes first and research is the second assignment. All other tasks are of lower priority. No other Department in this hospital does as much clinical work as we do.

The latter two statements reflect that the pursuit of productivity was fuelled by other than economic motives, but do not deny its dominance. Furthermore, it shows that the urge to "produce" was not imposed on them by their department manager, who rather had lower production rates, but the productivity drive was co-created by the team members themselves.

The attitudes were observable in the group dynamics of the core team itself as well. They allotted a lot of time to small talk in order to bond, create harmony and overcome conflicting views. And at the same time conversations were often interrupted impatiently, to be quick and produce decisions and results.

### **Skiping new routines**

As we can read in some of the quotes above, some participants chose to skip the new routine of the briefing. Or they performed the briefing in an "easy" way, without all participants present and by not taking all items of the briefing too seriously, such as the item "fit to fly" when having a cold or feeling tired or exhausted. Some professionals, mostly consultants, vented that they viewed standard procedures and checklists as just ticking-the-boxes for reasons of accountability. Given such a perception, these professionals saw no increased safety risk by skipping these new standard procedures. When

Jorin asked George why he did not attend the briefing she recalled his answer as: You can do that for me. In the time that you are attending the briefing and the sign in and waiting for the patient to be asleep, I can read so many articles and mails and do so many telephone calls.

As we can read in vignette 6, George preferred to hold on to his old habits to contain safety risks and to win time.

### Adhering to old routines and regulations

Some routines were practically always performed notwithstanding time pressure and regardless of whether the routine contributed to priorities or not. We observed for example that everyone putted on a mask when the sterile materials were brought into the operating room,

even though they told each other that after 15 minutes the masks do not withhold bacteria anymore. Also, the time out, performed just before the induction, was always performed, no matter the rush. As surgeon J stated: "I tell myself that the time out is really useful because it is not done to omit it. But if I'm honest with myself, I do not really believe it contributes to patient safety."

Also, the routine weekly morbidity and mortality meetings were always performed and usually attended by the residents and a few consultants. It was observed that the morbidity and mortality meetings were not so well attended by consultants as the daily handover. Jeroen and the resident Bram viewed them as "usually not very instructive". The meetings were obligatory for every department involved in accredited teaching programs for students and residents.

### Vignette 5. The morbidity and mortality meeting.

Annet the researcher is having an interview at the office of the department with Bram the new resident. He will replace Jorin, who is leaving the hospital. When Annet shares her observation that the morbidity en mortality meetings are always attended Bram ventilates his opinion.

Resident Bram: "There should be a certain format for such a meeting. For example, it is strange that the resident should always present a medical complication. Why? Then it becomes such an obligation, and there are already so many obligations. The next thing is that it is completely free what you want to discuss. If it would be a discussion about what could we have done differently, then that could be interesting. Now we present an article we found about the same treatment and where then happened this and that. That is nice but not very instructive. So, I would think: less often, multidisciplinary and a good format."

Another example of the influence of legislation was the rule that residents are not allowed to work longer than 13 hours in a row, because it is better for their health and for the consistent quality of care. This has led to rearrange their working schedules some years ago. For consultants, legislation leaves it up to the board of the hospital, which leaves it up to the Head of the Department. As a result, they regularly worked longer than 13 hours in a row. For several reasons consultants preferred schedules in which they serve longer shifts once in a while. One consultant expressed however: "I'm not so sure that I myself can judge whether I'm fit to perform after having worked all night long, but I just go on."

The fragments above show examples of adhering to a routine or habit, even though one does not value the habit

very highly. The first example concerns the time out that had become part of "the way we do things here". The majority of the professionals valued the contribution of the time out to reliability and safety and the ones who did not, adjusted themselves. After some time, the routine was not discussed any longer and performed automatically. Spending time on this old routine, even when one did not value it highly, did not contribute to time pressure. The other examples, the morbidity and mortality meeting and the maximum shift length, were performed because legislation required this routine to be fulfilled.

### Creating team situational awareness as a habit or incidentally.

### Vignette 6. The quick surgeon.

George enters the OR and takes a moment to overview the room. Then he says in a cheerful way to the anaesthesia nurse "Hi Toon, fellow, how are you?" He asks the anaesthetist "Do you want to advance today? Then, we will take care of that. The next operation will be done by A. so that will probably take 6 hours I'm afraid." In this tone he has small conversations with most team members. The OR nurse seems to be pleased to work with George because, as she whispers with a smile to the observer, "With him we will surely be ready on time, he is really fast". Resident A gives a short recapitulation of the briefing and the sign in and shortly thereafter incision starts. During the operation George is looking around regularly and he stays in contact with the anaesthesia team about blood loss etcetera. At every stage during the operation (removal of organs for example) he asks whether all materials and all team members are ready for the next stage in a clear voice and he only progresses when he hears their confirmations. By doing so every team member has awareness of the situation.

In a small conversation with an anaesthesia nurse, she says to the observer: "Even when there is a bleeding, you can ask him questions. He goes on communicating very well, so you always know where he is heading for and I can make myself clear where we are heading for."

This situation is interesting because on the one hand this senior consultant was refusing to spend time on attending the briefing, which was meant to create team situational awareness. But he created situational awareness in his own way, for himself, by relating to everybody, by monitoring the work of other team members during the operation, by clear communication and by creating check moments or small time-outs: at entering the OR, before incision, before removing an organ, at the verge of an imminent complication, before closing the wound, etc. And, as he explained during the CRM training, he informed the OR nurse already the day before about the materials needed. This way of working is not steered by a formal checklist, but by a personal habit in which he created many more checkpoints than the obliged ones. And although we interpret his habits as being oriented at creating situational awareness and control for himself as the leader of the team, the spinoff is that he created it for the team as a whole as well. And this feeling of oversight and control took away the time pressure while working fast. This was conveyed when the OR-nurse said happily “We will surely be ready on time”.

Another example is given in vignette 1. As soon as the team knew who was going to do what and when, time pressure dropped.

There was a significant difference in both situations. In vignette 1 there was a deliberate intervention and a breach in the normal pattern or habit to create team situational awareness, in order to dissolve the tension and to end the working day in time. The spin off was working in a kind of flow without distractions. In vignette 6 the behaviour was part of a normal pattern or habit to create situational awareness, in order to secure the flow of the operation at hand and to minimize interruptions and risks. Minimizing interruptions and risks, saves time as well.

## Discussion

In this section we will enhance the meaning of the results by discussing them from the combined perspective of reliable organising theory and habit theory.

We aimed to understand the phenomenon of time pressure in operating teams against the background of their effort to improve patient safety by implementing a briefing and speak up; and as such improving the reliability of the operating process. Because we studied time pressure against the background of the team trying to improve the reliability of their working process, we inevitably described not only how time pressure was created and dealt with, but also how they related to their improvement goal.

Our results showed that the attitudes creating time pressure were directed at speed, productivity, and harmony and that the coping behaviours varied from sticking to, or falling back into, habits and (habitually) creating situational awareness.

## Goal setting

Given the dominance of the time pressure discourse and the preoccupation with speed, productivity, and harmony, we interpret that creating team situational awareness was often motivated by these preoccupations. At the organisation level conditions like training, maximum working hours, and redundant staffing were secured.

An attribute of HRO's is preoccupation with failure. However, in the context of a hospital being preoccupied with failure can induce a risk-avoiding treatment policy which is not necessarily in the interest of and the choice of the patient. We infer from our results that teams being preoccupied with productivity and reducing time pressure create reliable organising just as much as long as they experience that team situational awareness is needed to attain one's goal and as long as they share a set of 'holy' safety routines (e.g. performing a time out) and conditions that are not to be violated.

We think that this is significant because it clarifies that at the team level the preoccupation with speed, productivity, harmony and the resulting time pressure, can motivate reliable organising,

## Fostering mindfulness by habits

In reliable organising theory the concept of mindful action and heedful interrelating is contrasted to habitual action. Mindful action has a quality of awareness and alertness, mindfulness is the “capability to induce a rich awareness of discriminatory detail and a capacity for action.” [15]. “In habitual action each performance is a replica of its predecessor whereas in heedful performance each action is modified by its predecessor” [22].

However, our results and especially vignette 6, show that situation awareness, alertness and habitual behaviour are closely connected. Team situational awareness can be fostered by triggering it in routines such as the briefings and time outs, and it might even be fruitful to drill the daily habit of cross monitoring and of creating multiple “mini time-outs”, like the way George did in vignette 6. We have only a limited amount of bandwidth available for conscious effort and thought. We need to make a habit of what can be a habit, to have enough bandwidth available for conscious mindful thought during unexpected events [23-26].

When we perceive the creation of team situation awareness as a habit, we think of other interventions than when we define them as a part of a shared behavioural pattern formed in a process of socialization. In the first definition we think of training and drilling and organising cues [21] that trigger the desired behaviour. Whereas Weick & Roberts [18] propose sharing narratives or vivid war stories by the senior members of the group as a way of socializing certain mindful behaviours. We suggest that drilling and cueing might be valuable interventions as well. These suggestions might form valuable input for future action research on establishing mindful behaviours as a group.

## Heedful interrelating and avoiding conflict

In the results we presented several examples of how the team valued good relations. This is shown in the small talk in the core team and in the way one tries to bring up sensitive subjects (vignette 1), establish relations within the team (vignette 6) and approach colleagues being late adopters of new working procedures (vignette 3). Whenever interpersonal relations are good, there is willingness for mutual help to attain one's goals. And good relations create psychological safety [20] which is essential to share one's observations and comprehension of the situation which in turn creates team situational awareness and resolves time pressure.

However, the other side of valuing good relations and harmony is the tendency to avoid conflict. The results show that one did not tend to speak up in the interest of oneself or the patient, until stress levels were already high (vignette 1). And even then, "one has to have the age and the guts" to take the bridge to constructive conflict. Thus, heedfully addressing or avoiding conflicts was a condition to both build and block situational awareness and consequently to both create and resolve time pressure.

When does one cross the line where it is wiser to avoid the possibility of a destructive conflict than to miss the chance for a constructive conflict? This is fully up to personal judgement of the pertinent situation. In vignette 1 the nurses chose to give the lead to the nurse with experience. If there would have been another configuration of team, would it then have been wise to speak up? In the team it was highly situational how such a situation evolved. Thus there was no collective mind in which addressing a conflict was part of a shared valued way of behaving. The same type of dilemma's were observed among airline pilots, even though they were trained to handle conflict frequently, they were still balancing and searching to choose the conflict strategy that fitted best in a specific configuration [27].

It would be interesting for future research to experiment with developing collective mind by means of vivid war stories that do not only cover saving patients from harm but also handling constructive conflict. It might be that the latter provides more opportunities for storytelling because it is more prevalent.

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